

LINEAR FUNCTIONS UNIT VOCABULARY

Direct variation	Inequality	Intercepts	Linear
Parallel lines	Parent functions	Perpendicular lines	
Proportion	Rate of Change	Slope	Slope-intercept form
Standard form	Transformation	Translation	

TAKS VOCABULARY REVIEW

dilate	parameter	reflect	rotate	transformation	translation
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MATERIALS

Cornell notes	graphing calculators	manipulatives	hexagon shapes
textbook	D2SC Patterns WS/PPTs	laptop computer	

AVID and ESL Strategies

Think-Pair-Share	4 Corners	Expert/Consultant
Carousel	KWL	Frayer/Venn diagrams
Quick Write	Quick Work	Marzano's 6 Steps - Vocabulary

TECHNOLOGY

Reminder: Students will bring laptops to class.

Cognitive Tutor: Students start to see the multiple representations of functions really well with this software program. The program will require the students to read a scenario and generate a function and then graph. Students are asked to find the meaning of the slope and the intercepts.

Understanding Math; Holt Online.

Gizmos	On-line TEKS Related Games
Interventions	Assessments

SPIRALING & TAKS

Equations, expressions, proportions, ratios, percents, translations through warm-ups.

4th PERIOD**Voyager Math**

Monday: Level H Lesson 3

Tuesday: Level H Lesson 4

Wednesday: Level H Lesson 5

Thursday: Level H Lesson 6

Friday: Level H Lesson 7

Writing and Graphing Linear Equations

“The study of linear functions is important as it provides students with their first experience of identifying and interpreting the relationship between two dependent variables. ‘Linear functions’ is certainly a basic algebra topic but it is of fundamental, not trivial, importance. It marks the point at which many students decide that mathematics is meaningless and difficult.”

Robyn Pierce

Linear Functions and a Triple Influence of Teaching on the Development of Students’ Algebraic Expectation (2005)

STATE/DISTRICT OBJECTIVES:

- [111.32.B.A.06.A](#) - The student is expected to develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations;
- [111.32.B.A.06.B](#) - The student is expected to interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs ;
- [111.32.B.A.06.C](#) - The student is expected to investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$;
- [111.32.B.A.06.D](#) - The student is expected to graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y intercept;
- [111.32.B.A.06.F](#) - The student is expected to interpret and predict the effects of changing slope and y -intercept in applied situations ;
- [111.32.B.A.07.A](#) - The student is expected to analyze situations involving linear functions and formulate linear equations or inequalities to solve problems ;
- [111.32.B.A.07.B](#) - The student is expected to investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities ;
- [111.32.B.A.07.C](#) - The student is expected to interpret and determine the reasonableness of solutions to linear equations and inequalities.

Teacher TAKS Skills Preview:

- use slope as the basis for writing equations (this likely means that the first types of equations your students will write will be in point-slope form, which can then lead naturally into slope-intercept form)
- concentrate on multiple representations, especially tables and graphs at first, finding slope from these, and using that slope to write equations
- use multiple representations, taking advantage of verbal representations as a good jumping off point for writing linear equations in standard form since that is a natural flow
- address the meanings of slope and intercepts in context, as well as what independent and dependent variables represent in the context of a real world problem

Monday, December 7, 2009

Solving for y (Slope-Intercept Form) Intercepts, and Slope
Holt 5-1, 5-2, & 5-6; TEKS A.6A-D, A.7.A-C

Warm-Up: Holt Quiz transparency 5-6**Engage:** n/a

Objective: The students will solve linear equations for the variable y; determine slope and y-intercept from the formula; create a table; plot the points on a graph; put the equation in point-slope form and standard form; create a word problem to go with the graph, describe the dependent and independent variables; describe the meaning of the slope; determine a reasonable domain and range.

Explore: Create multiple representations with verbal description activity (complete sentences).

Elaborate: Think-Pair-Share. Independently, each student will determine how the slope, the x-intercept and the y-intercept change when the input (domain) varies. They will discuss their results with their partner, discover whether or not they agree, find a supporting reason which explains the accuracy of their results in words (related specifically to the problem.)

Explain: The teacher will relate facilitate student explanations to draw out a vocabulary review in the process. The teacher will help the students recall and/or teach/reteach a Production Possibilities Frontier (faced by businesses and countries) to demonstrate to the students in a concrete way the use of Algebra in day to day decision-making. (**Honors:** Discuss Comparative Advantage and have the students determine optimal course of action.)

Evaluate: Informal assessment by the teacher as he/she interacts with the students and checks on their understanding/progress.

Exit Ticket: Students will set a goal for Thursday's test and write what they will do to achieve their goal. They will also write one thing they learned or one question they need to have answered.

REVIEW 3.1 Part 1 Adapted
Point-Slope Form, Slope-Intercept Form, Standard Form;
Slope, Intercepts, Graphs, Tables, Ordered Pairs, and Equations
TEKS A.6A-D, A.7.A-C

Warm-Up: TAKS prep

Engage: N/A

Objective: The student will be able to represent patterns, relationships, and linear functions using multiple representations. The students will relate domain/range, independent/dependent, rate of change/slope and parent function to word problems represented by linear equations. Students will demonstrate understanding of the relationships between the multiple representations of linear equations and their associated meanings.

The student:

Understands the notation used to represent functions.

Understands the relationship between expressions and equations.

Understands the relationship between graphs and corresponding expressions.

Understands the concept of direct variation functions.

Explore: N/A

Explain: N/A

Elaborate: N/A

Evaluate: Teacher will work in small groups with students to determine understanding of the application of concepts.

Wednesday, December 9, 2009**REVIEW 3.1 Part 2 Adapted**

Point-Slope Form, Slope-Intercept Form, Standard Form;
Slope, Intercepts, Graphs, Tables, Ordered Pairs, and Equations
TEKS A.6A-D, A.7.A-C

Warm-Up: TAKS prep**Engage:** N/A

Objective: The student will be able to represent patterns, relationships, and linear functions using multiple representations. The students will relate domain/range, independent/dependent, rate of change/slope and parent function to word problems represented by linear equations. Students will demonstrate understanding of the relationships between the multiple representations of linear equations and their associated meanings.

The student:

Understands the notation used to represent functions.

Understands the relationship between expressions and equations.

Understands the relationship between graphs and corresponding expressions.

Understands the concept of direct variation functions.

Understands the concept of linear functions.

Explore: N/A**Explain:** N/A**Elaborate:** N/A

Evaluate: Teacher will work in small groups with students to determine understanding of the application of concepts.

TEST 3.1 Adapted

Point-Slope Form, Slope-Intercept Form, Standard Form;
Slope, Intercepts, Graphs, Tables, Ordered Pairs, and Equations
TEKS A.6A-D, A.7.A-C

Warm-Up: N/A

Engage: N/A

Objective: The student will be able to represent patterns, relationships, and linear functions using multiple representations. The students will relate domain/range, independent/dependent, rate of change/slope and parent function to word problems represented by linear equations. Students will demonstrate understanding of the relationships between the multiple representations of linear equations and their associated meanings.

The student:

Understands the notation used to represent functions.

Understands the relationship between expressions and equations.

Understands the relationship between graphs and corresponding expressions.

Understands the concept of direct variation functions.

Understands the concept of linear functions.

Explore: N/A

Explain: N/A

Elaborate: N/A

Evaluate: Formal assessment - Test

Friday, December 11 and Monday, December 14, 2009

Earn/Spent Project (see Brain-based Wiki)

Warm-Up: TAKS prep Quiz

Engage: Give the students an opportunity to earn/spend money; class discussion regarding the constraints of earning/spending money.

Objective: Reinforce what the students have already learned about linear equations and introduce solving systems of linear equations with a hands-on activity.

- 1.) Determine which variable is independent, and which is dependent.
- 2.) Determine a feasible domain and range.
- 3.) Complete all representations/forms on the multi-representations sheet.
- 4.) Explain the meaning of the slope in a complete sentence.
- 5.) Explain the meaning of the intercepts in complete sentences.
- 6.) Choose a solution (a point on the line) and explain why the choice was made.
- 7.) Discover that the solution is the point where the 2 linear equations intersect.

Explore: The students will choose which spend/earn activity they will participate in and complete the associated work.

Quick-Work: The students will form pairs in which one will be the 'spender' and the other student will be the 'earner.' Each will complete their objectives independently.

Collaboration: After working independently on their portion, the students will come together to determine a solution they are both happy with choosing.

Explain: Think-Pair-Share: The students will use this strategy to evaluate their accuracy and decision-making as well as that of their partners. After sharing, discussing and evaluating, the partners will come to a conclusion and share that conclusion with their classmates.

Elaborate: Students will consider what new information may have changed their initial decision.

Evaluate: Informal assessment by the teacher as the class progresses through the activity.